Health Consultation

Outdoor Air Quality Evaluation
Philip Services - Georgetown Facility
734 South Lucile Street, Seattle, Washington

May 22, 2001

Prepared by

Washington State Department of Health
Under Cooperative Agreement with
Agency for Toxic Substances and Disease Registry

Foreword

The Washington State Department of Health (DOH) has prepared this health consultation in cooperation with the Agency for Toxic Substances and Disease Registry (ATSDR). ATSDR is part of the U.S. Department of Health and Human Services and is the principal federal public health agency responsible for health issues related to hazardous waste. This health consultation was prepared in accordance with methodologies and guidelines developed by ATSDR.

The purpose of a health consultation is to identify and prevent harmful human health effects resulting from exposure to hazardous substances in the environment. The health consultation allows DOH to respond quickly to a request from concerned residents for health information on hazardous substances. It provides advice on specific public health issues. DOH evaluates sampling data collected from a hazardous waste site, determines whether exposures have occurred or could occur, reports any potential harmful effects, and recommends actions to protect public health.

For additional information or questions regarding DOH, ATSDR or the contents of this health consultation, please call the Health Advisor who prepared this document:

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Glossary

Agency for Toxic Substances and Disease Registry (ATSDR)	The principal federal public health agency involved with hazardous waste issues, responsible for preventing or reducing the harmful effects of exposure to hazardous substances on human health and quality of life. ATSDR is part of the U.S. Department of Health and Human Services.
Contaminant	Any chemical that exists in the environment or living organisms that is not normally found there.
Exposure	Contact with a chemical by swallowing, by breathing, or by direct contact (such as through the skin or eyes). Exposure may be short-term (acute) or long-term (chronic).
Hazardous substance	Any material that poses a threat to public health and/or the environment. Typical hazardous substances are materials that are toxic, corrosive, ignitable, explosive, or chemically reactive.
Indeterminate public health hazard	Sites for which no conclusions about public health hazard can be made because data are lacking.
Inorganic	Compounds composed of mineral materials, including elemental salts and metals such as iron, aluminum, mercury, and zinc.
Oral Reference Dose (RfD)	An amount of chemical ingested into the body (i.e., dose) below which health effects are not expected. RfDs are published by EPA.
Organic	Compounds composed of carbon, including materials such as solvents, oils, and pesticides which are not easily dissolved in water.
Parts per billion (ppb)/Parts per million (ppm)	Units commonly used to express low concentrations of contaminants. For example, 1 ounce of trichloroethylene (TCE) in 1 million ounces of water is 1 ppm. 1 ounce of TCE in 1 billion ounces of water is 1 ppb. If one drop of TCE is mixed in a competition size swimming pool, the water will contain about 1 ppb of TCE.

Risk	The probability that something will cause injury, linked with the potential severity of that injury. Risk is usually indicated by how many extra cancers may appear in a group of people who are exposed to a particular substance at a given concentration, in a particular pathway, and for a specified period of time. For example, a 1%, or 1 in 100 risk indicates that for 100 people who may be exposed, 1 person may experience cancer as a result of the exposure.
U.S. Environmental Protection Agency (EPA)	Established in 1970 to bring together parts of various government agencies involved with the control of pollution.
Volatile organic compound (VOC)	An organic (carbon-containing) compound that evaporates (volatilizes) easily at room temperature. A significant number of the VOCs are commonly used as solvents.

Background and Statement of Issues

The Washington State Department of Health (DOH) has prepared this health consultation in response to health concerns raised by businesses located adjacent to the Philip Services Corporation's (Philip Services) facility in the Georgetown area of Seattle, King County, Washington where contaminants have reportedly been released to ambient air.

The Philip Services' Georgetown facility is a permitted treatment and storage facility for industrial and household hazardous wastes located at 734 South Lucile Street (Figure 1). The facility is bounded by South Lucile Street to the south; Union Pacific Railroad – ARGO Yard to the east; Stone, Drew-Ashe, and Jones to the west; and Amalgamated Sugar Company to the north. Most of the site is covered with structures or pavement and lies within a mixed industrial, commercial, and residential area.

Philip Services handles a number of hazardous wastes including contaminated solid wastes, acids, bases, and liquids and sludges that contain petroleum products, solvents, metals, pesticides, polychlorinated biphenyls (PCBs), antifreeze, cyanide, and oxidizing agents. The hazardous wastes are received and shipped off-site in bulk by tanker trucks, railcar tankers, roll-off boxes and other bulk containers and in containers such as drums, bales, and pails.[1]

Processes permitted at this facility include fuel blending, oxidizer treatment, and waste consolidation. Waste distillation and treatment of cyanide containing waste occurred at the facility in the past but were discontinued in 1996 and 1999, respectively.[1]

Hazardous waste consolidation occurs in the south bay of the upper warehouse and the process containment building (Figure 2). Most of the warehouse and the north, south, and west field container storage areas are used to store covered containers of hazardous waste. Hazardous wastes are also stored in aboveground tanks at the acid/alkaline storage area, cyanide tank system area, and the dangerous waste fuel tank system.

Emission control systems have been installed in some areas of the site to reduce the concentration of chemicals discharged to ambient air.[1] These systems operate under permits issued by the Puget Sound Clean Air Agency (Clean Air).[2, 3, 4]

Site Visit

A DOH representative visited the Philip Services' Georgetown facility on February 1, 2001, to observe site conditions.[5] A Washington State Department of Ecology (Ecology) representative and representatives from Philip Services participated in the site visit.

Hazardous waste handling occurs at a number of locations at the facility including the check-in area where some of the hazardous wastes are delivered to the site; the south bay of the upper warehouse where inorganic acids and bases are consolidated; the process containment building where paints, thinners, motor oil, and other organic compounds are processed and consolidated;

and the railroad car and truck hazardous waste loading/unloading areas. Most of the remaining area of the facility is used for temporary hazardous waste storage.

Philip Services reported during the site visit that they were in the process of moving the organic chemical waste consolidation area from the south bay of the upper warehouse to the process containment building. No organic waste consolidation was being done while this move was occurring. However, processing was scheduled to begin again the week of February 5, 2001.

Little hazardous waste handling was observed during the site visit and no odors or spills were noted. However, potential air emission sources were identified during the site visit.

Potential Air Emission Sources

Drums of hazardous waste that are brought to the facility are opened and tested at the check-in area to verify the contents of the drums. The check-in area contains no emission control system. During the site visit, a few drums were opened for sample collection. The Philip Services' representative indicated that a maximum of four drums are opened at one time and no drum remains open for more than 15 minutes.

Solid waste that is brought to and generated at the facility is temporarily stored in a 100-cubic yard truck trailer, covered with a tarp, near the check-in area. Solid waste that generates odors, such as oily rags, may be stored in the trailer.[6] The trailer typically remains at the site for approximately one to two weeks, until it is full. No emission control system is located in this area of the site.

An activated carbon treatment system is located at the process containment building where some of the facility organic waste handling and consolidation activities occur. A vapor collection system routes the captured chemical vapors through the activated carbon treatment system to remove various contaminants prior to discharge to ambient air.

Chemical vapors collected at the railroad car and truck hazardous waste loading/unloading areas are generally routed to the aboveground tanks where the hazardous waste is stored. Periodic thermal venting occurs at the tanks to reduce pressure in the system. When thermal venting is necessary, the vapors are routed through an activated carbon treatment system before release to ambient air.

According to the Philip Services' representative, the activated carbon treatment systems at the railroad car and truck loading/unloading areas and the process containment building are monitored weekly with a photoionization detector (PID) to determine whether the activated carbon is effectively removing contaminants from the vapor stream before it is discharged to ambient air. A PID reading of 5 parts per million (ppm) is a trigger level used by Philip Services to indicate chemical breakthrough of the treatment system and triggers replacement of the activated carbon.[7] Based on observation of some the recorded PID readings kept by Philip Services, however, it appears that the systems may periodically exceed the 5 ppm trigger level

before the activated carbon is replaced. Spent carbon is shipped off-site for incineration.

An activated carbon vapor treatment system is also located at the south bay of the upper warehouse. The south bay also contains an air scrubber system to enhance recovery of base and acid vapors before the air passes through the activated carbon system. The air scrubber system reportedly operates under optimal conditions when the water in the treatment system is maintained at a pH of 7. A Philip Services' representative indicated that the pH of the system is measured periodically. Caustics are added to the system, as necessary, to maintain optimal operating conditions. No written records were available, however, to determine the frequency or the results of the air scrubber monitoring.

A soil vapor extraction (SVE) system is located in the east central portion of the site to capture volatile organic compounds from contaminated subsurface soils. A catalytic oxidation system destroys the captured volatile organic chemicals and a wet scrubber removes the resultant acid gas from the air stream before it discharges to ambient air. No samples are collected and analyzed to verify that the treatment system reduces contaminant concentrations in the discharged vapors below levels that are harmful to human health.

Discussion

Businesses located near Philip Services' facility report that hazardous waste handling practices at the facility have resulted in the release of chemicals to ambient air. These releases have been characterized as "odors," "vapors," "steam vapors," "gases," "fumes," "airborne discharges," "dust," and "mist."[8, 9, 10] Analytical data are not available to characterize the frequency, amount, or chemical make-up of these releases. Reports from these businesses indicate, however, that such releases occur on a fairly frequent basis with varying duration.[8, 9, 10]

Employees at a nearby rail yard have reported releases of chemicals from the Philip Services' facility that have resulted in health effects including headache, nausea, dizziness, shortness of breath, and vomiting. Two railroad workers were taken to the hospital in July 1999 after one of the reported chemical releases occurred.[8]

Various agencies have identified design, operation, maintenance, and monitoring deficiencies at the Philip Services' facility that may be associated with the chemical releases reported by the businesses near the facility. A representative from Clean Air inspected the facility in October 1999 and noted that the carbon treatment system in the process containment building was not being operated properly. It was also noted during that inspection that the hoods, booths, and duct work that send contaminated air to the activated carbon filters in the process containment building and south bay of the upper warehouse did not appear to meet standard design parameters.[11] These types of treatment system deficiencies could result in harmful levels of chemical being released to ambient air. In addition to the observed problems with the activated carbon treatment system design and operation in the process containment area and south bay of the upper warehouse, the Clean Air representative also observed that the systems in these buildings and at the hazardous waste storage tanks were likely being monitored when no

emissions were being directed to them.[11] Such monitoring provides no relevant information about the facility's effect on ambient air.

The Clean Air representative also observed that the catalytic oxidation unit and the wet scrubber used to treat vapors from the SVE system in the eastern portion of the facility, adjacent to the rail yard, were not being maintained and monitored as required by their air permit.[11] Operation of the SVE system without appropriate maintenance and monitoring could result in harmful levels of chemicals being discharged to ambient air.

Clean Air has recently suggested that all transfer operations including rail car loading and unloading be performed within enclosures with properly designed hooding. They also recommended that the ventilation systems at the facility be redesigned by a certified industrial hygienist (CIH). A CIH is trained to design industrial ventilation systems[12]

In its 1999 VOC emissions/release report, Philip Services estimated that 3,460 pounds of volatile organic compound emissions were generated at the facility during that year. Approximately 920 of the 3,460 pounds of volatile organic compounds were released to ambient air without treatment. Approximately 630 pounds of the untreated volatile organic compounds were fugitive emissions from pipes and pumps.[1] Philip Services reports that monthly monitoring of the pipes, pumps, and valves with a PID has not shown any emissions.[7] However, the PID is a screening level monitoring device used to measure total VOCs in the parts per million range. It is not designed to measure low levels of individual VOCs that may be harmful to human health when discharged to ambient air.

Philip Services reports that a point source collection system is used to collect contaminated vapors from those areas of the process containment building where paints, solvents, and other organic chemicals are handled. The captured vapors are routed through the activated carbon treatment system before discharging to ambient air. However, the percentage of vapors captured in the process containment building is unknown.[7] In its 1999 VOC emissions/release report Philip Services reported that only 50 percent of the emissions generated in the south bay of the upper warehouse were being treated prior to release to ambient air.[1]

The information provided by Philip about the process containment building and the south bay of the warehouse is consistent with observations made by the Washington State Department of Ecology, during a March 1, 2000, Resource Conservation and Recovery Act (RCRA) air quality compliance inspection. It was noted that emissions from portions of work areas where hazardous chemicals were being handled vented directly to ambient air rather than being routed through the treatment systems. The March 2000 inspection was a follow-up to a December 1992, Environmental Protection Agency (EPA) air emission compliance inspection.[13]

Stone, Drew-Ashe, and Jones, a business located adjacent to the west side of the Philip Services property, reported that their two easternmost roof vents were replaced by Philip Services after they notified them that the vents were rusted.[14] The Stone, Drew-Ashe, and Jones building is located near the south bay of the upper warehouse where acids and bases were being handled

without adequate emission capture.

As noted above, emissions from the Philip Services' facility are not limited to those that discharge through the various treatment systems. Untreated emissions may discharge to ambient air at the truck trailer where vapor generating solid waste may be temporarily stored as well as from facility piping, pumps, rail car and truck loading/unloading areas, and the process containment building. The work area and the type of work done in the south bay of the upper warehouse was recently modified to prevent the release of untreated discharges to ambient air. However, no data are available to confirm that the modifications eliminated the releases.

Until recently, periodic monitoring of the activated carbon treatment systems with a PID and measurement of pH at the air scrubber at the south bay of the upper warehouse appear to be the only tools used to assess whether Philip is discharging contaminants to ambient air. Although reasonable screening tools, they are not a replacement for air sampling and analysis. Philip reports that they recently conducted some facility perimeter air sampling.[7] However, based on information provided by the Washington Department of Labor & Industries (L&I), it appears that this sampling was conducted during a time of low level activity at the facility.[15] Although these various monitoring activities do provide some information about potential emissions from the facility, they are not adequate for determining whether the Philip Services facility is a source of harmful levels of chemicals discharging to ambient air.

Conclusion

The air emissions from the Philip Services' facility poses an indeterminate health risk. Only limited air quality data is available for the facility. This data is not suitable for evaluating potential human health effects because it is either screening level or estimated emission data or data that does not represent air quality during typical operations at the facility.

Recommendations

1. Philip Services should ensure that their Georgetown facility is designed, operated, maintained, and monitored to prevent the release of harmful levels of chemicals to ambient air.

2. Local, state, and federal permitting and oversight agencies should evaluate whether observed design, operation, maintenance, and monitoring deficiencies, which could be contributing to the release of harmful levels of chemicals to ambient air, have been adequately addressed by Philip Services. The agencies, in coordination with Philip Services, should develop schedules to address outstanding deficiencies.

3. Outdoor air monitoring should be conducted by Philip Services to evaluate whether harmful levels of chemicals are discharging from the facility to ambient air. The monitoring

program, which should include a work plan and sampling and analysis plan, should be designed and implemented in mid-2001, in coordination with relevant permitting and oversight agencies. Sampling locations should be selected at, within, and adjacent to the facility boundaries to adequately characterize air emission sources and potential receptors.

The outdoor air, monitoring work plan and sampling and analysis plan should be submitted to DOH for review.

Preparer of Report

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2. Notice of Construction and Application for Approval, Soil Venting, Puget Sound Air Pollution Control Agency, August 4, 1993.

3. Notice of Construction and Application for Approval, Emission Control Equipment Installation, Puget Sound Air Pollution Control Agency, September 10, 1993.

4. Notice of Construction and Application for Approval, Reactive Chemical Treatment of Small Quantities, Puget Sound Air Pollution Control Agency, June 8, 1989.

5. Site Visit Summary, Washington State Department of Health, February 1, 2001.

6. Personal communication with Bill Glasgow, Philip Services, April 17, 2001.

7. Comments on DOH Draft Outdoor Air Quality Evaluation, Philip Services - Georgetown Facility (March 26, 2001), Mo Azose, Philip Services, April 13, 2001.

8. Letter from Glenn Strieker, Rail Terminal Services to Ed Jones, EPA, August 26, 2000.

9. E-mail from Kristee Crowder (Stone, Drew- Ashe, and Jones) to Melissa McAfee, Puget Sound Clean Air Agency, August 9, 2000.

10. Letter from Dean DeLorey, Amalgamated Sugar Company to Galen Tritt, Washington State Department of Ecology, October 13, 1999.

11. Inspection Report, Philip Services Corp., Puget Sound Clean Air Agency, October 20, 1999.

12. E-mail from Gerry Pade, Puget Sound Clean Air Agency, to Barbara Trejo, DOH, March 29, 2001.

13. Letter from Galen Tritt, Washington State Department of Ecology, to William Glasgow, Philip Services Corporation, September 7, 2000.

14. Personal communication with Pat Drew, Stone, Drew-Ashe, and Jones, March 22, 2001

15. Personal communication with Nancy Lee, Washington Department of Labor & Industries, May 17, 2001.

16. Georgetown Facility Site Plan, Burlington Environmental Inc., undated.

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Certification

This Health Consultation was prepared by the Washington State Department of Health under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the health consultation was begun.

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The Division of Health Assessment and Consultation, ATSDR, has reviewed this public health consultation and concurs with the findings.

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